

Chapter 7.24

Providing Mobile Multimodal Social Services Using a Grid Architecture

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ABSTRACT

In this chapter, we describe a grid approach to providing multimodal context-sensitive social services to mobile users. Interaction design is a major issue for mobile information system not only in terms of input-output channels and information presentation,

but also in terms of context-awareness. The proposed platform supports the development of multi-channel, multi-modal, mobile context aware applications, and it is described using an example in an emergency management scenario. The platform allows the deployment of services featuring a multimodal (synergic) UI and backed up on the server side by a distributed architecture based on a GRID approach

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to better afford the computing load generated by input channels processing. Since a computational GRID provides access to “resources” (typically computing related ones) we began to apply the same paradigm to the modelling and sharing of other resources as well. This concept is described using a scenario about emergencies and crisis management.

INTRODUCTION

The penetration of mobile device in western countries is high and still increasing. At the same time new generation terminals feature ever increasing computing power, opening new possibilities for innovation, especially in service delivery.

One emerging trend in service evolution is for services to cater not only to individuals but also to communities of users. Communities are a social phenomenon where people with common interests, experiences, and objectives are brought together. They provide a social place where individuals exchange and share information, knowledge, emotions and jointly undertake activities. Managing the creation or deletion of flexible communities improves the user experiences in communities (NEM, 2006).

MoSoSo (Mobile Social Software), is a class of mobile applications that aims to support social interaction among interconnected mobile users (Lugano, G., 2007). While existing Internet-based services have already shown the growing interest in communication support for communities, *MoSoSo* adds additional dimensions to group communication by exploiting contextual data such as the user geographical position (Counts, S., 2006).

When designing *MoSoSo* applications, three important differences between desktop and mobile environments should be taken into account:

- The physical context of use is no longer static and poses some constraint to user attention;

- The social context is also dynamic: mobile communities member are tied up by common interest and contextual information, like location and time;
- *MoSoSo* applications are designed not just for communication but for usage in everyday life situations: users are always socially connected.

In our vision the *MoSoSo* concept could also benefit “public” (e-Government) services leading to innovative, more effective mobile services, able to leverage on dynamic management of *ad-hoc* communities, context-awareness (i.e. time and location), user profile management and multimodal interaction.

One domain where such benefits will matter most will be emergencies and crisis management. In fact, the response to such situations typically implies the coordination of physical resources, (emergency services personnel, often belonging to different organizations, or even possibly volunteers) in hardly predictable environments in situations where ineffective operations can cause the loss of lives.

From an IT standpoint, implementing such a vision requires coordination of services and sharing of resources among different organizations that typically operate heterogeneous hardware and software environments. The Virtual Organizations paradigm address this issue: “VOs enable disparate groups of organizations and/or individuals to share resources in a controlled fashion, so that members may collaborate to achieve a shared goal” (Foster I., 2001). In those circumstances dynamism, flexibility and interoperability become essential requirements.

Interoperability, in particular, is a key issue in the e-Government domain due to the increasing demand for integrated services. We aim to integrate *MoSoSo* users into a typical Grid resource management model. To this end, we designed an experimental platform to support the development of multimodal *MoSoSo* application, allowing an

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